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CTF-066972

Exemption 7

REPT

APR 1 '91

CENTRAL TEST

COMPONENT RELIABILITY ASSESSMENT

WEAPON SYSTEM: W31-2

SUBASSEMBLY: SAll2 Capacitor

FAILURE EVENT: J₇ -- Failure of the x-unit capacitor bank.

ASSESSMENT VALUE: J₇ -- 0.036

ASSESSMENT DATE: April 1988

RELIABILITY ANALYST: Exemption 6 7222

Exemption 6

ASSESSMENT RATIONALE:

The SAll2-xx-xx is from a family of hermetically-sealed, oil-impregnated capacitors manufactured by Sprague Electric. Prior to 1978, data from all systems using SAll2 Capacitors (second suffix -00, -01, and -02) were considered in assessing the failure probability of these capacitors. However, during the 1978 B28 system lab component testing, it was observed that two -00 units failed the capacitor high voltage production spec of Exemption 7.

A special study of -00 and -01 capacitor high voltage breakdowns of 18-20 year old units followed and confirmed that the high voltage stand-off capability of the -00 capacitors had degraded considerably compared with the -01 capacitors (Reference 1). These tests were initiated to test high voltage breakdown of SAll2s after units had been stored and stabilized at -35°C in a horizontal position (orientation in weapon use) versus previously tested units that had been stored in header down position, Exemption 7. A total of 374 -00 capacitors have been tested to high voltage breakdown (in the horizontal position); lowest breakdowns of Exemption 7 and Exemption 7 occurred during firing set tests at Pantex.

Figure 1 shows the high voltage breakdown test results of the 374 capacitors plotted on normal distribution probability paper in order to estimate the probability of an SAll2 failing at Exemption 7. Also shown in Figure 1 are the extrapolation lines when the total tests results were based on 224 and 314 units. Based on the results of Figure 1, the assessment for Event J₇ remains 0.036 (12 x 0.003).

Reference 1: Memorandum, C. R. Clark, 1223, to Distribution, Subject: Data from Recent SAll2 Capacitor Tests (U), 1/31/79.

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Figure 1

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